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EXAMINER	
HINDENLANG, ALISON L	
ART UNIT	PAPER NUMBER
1791	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,235	SIMMELINK ET AL.	
	Examiner	Art Unit	
	ALISON HINDENLANG	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/26/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3, 7-11, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention as they fail to define Ln (claims 3, 7, 8, 11, and 13) and Lo (claims 9-11). This makes the scope of the claims indefinite because it is unclear what values are being used in the ratios claimed.

Claim Objections

3. Claims 4, 8, 10 are objected to because of the following informalities:

a. Claim 4, which depends from Claim 1, reads "wherein the cone angle is from 10 to 60°". Claim 1 does not provide antecedent basis for "the cone angle". Examiner recommends changing Claim 4 to depend from Claim 3.

b. Claim 8, which depends from Claim 1 through Claims 6 and 5, reads "wherein the Ln/Dn ratio is at most 15". None of Claims 1, 5, or 6 provide antecedent basis for "the Ln/Dn ratio" or for the terms "Ln" or "Dn". Examiner recommends changing the dependency to include Claim 3.

c. Claim 10, which depends from claim 8, reads "wherein the ratio Lo/Do is at least 10". Claim 8 does not provide antecedent basis for "the ratio Lo/Do", "Lo" or "Do". Examiner recommends changing Claim 10 to depend from Claim 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-8, 12, and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kavesh (US 6448359) (related to EP 0064167 already of record).

6. With respect to claim 1, Kavesh teaches:

Process for making high-performance polyethylene multifilament yarn ("preparing a high tenacity, high modulus multi-filament yarn", column 1, lines 37-39) comprising the steps of

a) making a solution of ultra-high molar mass polyethylene in a solvent ("extruding a solution of polyethylene and solvent", column 1, lines 39-40);

b) spinning of the solution through a spinplate containing a plurality of spinholes into an air-gap to form fluid filaments (through a multiple orifice spinneret into a cross-flow gas stream", column 1, lines 41-42), while applying a draw ratio DRfluid ("stretching the fluid product", column 1, line 43);

c) cooling the fluid filaments to form solvent-containing gel filaments ("quenching the fluid product in a quench bath…to form a gel product", column 1, line 46-48);

d) removing at least partly the solvent from the filaments ("removing the solvent from the gel product", column 1, line 49); and

e) drawing the filaments in at least one step before, during and/or after said solvent removing, while applying a draw ratio DRsolid ("stretching the gel product", column 1, line 48)

… and DRag at least 1 ("jet draw must be at least 5:1, and is preferably at least about 12:1", column 5, lines 9-11).

Kavesh does not define a DR fluid as claimed:

characterized in that in step b) a fluid draw ratio DRfluid = DRsp X DRag of at least 50 is applied, wherein DRsp is the draw ratio in the spinholes and DRag is the draw ratio in the air-gap, with DRsp greater than 1

However, DRsp is defined in the specification as DRsp = $(Do/Dn)^2$. Figure 2 of Kavesh clearly shows that Do – the spinneret entry hole diameter is several times the size of the spinneret capillary outlet. Given that Kavesh discloses that the DRag is preferably least 12, DRsp need only be just over 4 (4.167) such that Do/Dn needs only be slightly greater than 2 (2.041). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a ratio of 2 or greater between spinhole inlet and outlet based on figure 2 of Kavesh.

7. With respect to claim 2, Kavesh further teaches that "the spinplate contains at least 100 spinholes" ("yarn of about 12 to about 1200 filaments" column 1, line 66).

8. With respect to claim 3, Kavesh further teaches:

wherein the spinhole has a geometry comprising a contraction zone, with a gradual decrease in diameter from diameter Do to Dn ("the spinneret holes 28 should have a tapered entry region 30", column 4, lines 49-50) with a cone angle in the range 8-75°,(see figure 2) and wherein the spinhole comprises a zone of constant diameter Dn with a length/diameter ratio Ln/Dn of from 0

to at most 25 downstream of a contraction zone ("followed by a capillary region of constant cross-section 32 in which the length/diameter (L/D) ration is more than about 10:1", column 4, lines 50-52).

9. With respect to claim 4, the cone angle illustrated in figure 2 of Kavesh falls within the 10 to 60^{o} range claimed.

10. With respect to claims 5 and 6, figure 2 of Kavesh shows the spinhole inlet diameter to be several times greater than the outlet diameter. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a spinneret with a draw ratio in the spinholes of at least 5 or 10 based on figure 2 of Kavesh.

11. With respect to claims 7 and 8, Kavesh teaches "the spinneret holes 28 should have a tapered entry region 30 followed by a capillary region of constant cross-section 32 in which the length/diameter (L/D) ratio is more than about 10:1" (column 4, lines 49-52, figure 2).

12. With respect to claim 12, as discussed in claim 1, Kavesh teaches DRag's of at least 5, preferably at least 12 and obviates DRsp's of at least 4 for a DRfluid of 50. In the examples Kavesh further discloses using jet draw ratios of 22.7 and 33.8 (column 6, lines 51-56, Table 1). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to apply a DRfluid of at least 100 to the method taught by Kavesh.

13. With respect to claims 14 and 15, Kavesh teaches "yarn of about 12 to about 1200 filaments" (column 1, line 66).

14. Claims 9, 10, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kavesh (US 6448359) as applied to claim 1 above, and further in view of Chau (US 5296185) (related to WO 94/12703 already of record).

15. With respect to claim 9, Kavesh does not teach:

wherein the spinhole further comprises an inflow zone of constant diameter of at least Do, with a ratio Lo/Do of at least 5.

In the same field of endeavor, spinning polymer fibers, Chau teaches spinholes containing spinholes with constant diameter inlet zones zones (column 5, lines 31-32, figure 1) for the purpose of effectively transitioning to the capillary section. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spinholes used in the method taught by Kavesh by adding a constant diameter inlet zone as taught by Chau for the purpose of effectively transitioning to the capillary section.

The combination as applied above discloses the claimed invention except for the inlet zone having Lo/Do of at least 5. It would have been obvious to one having ordinary skill in the art at the time of the invention to choose such a ratio since Chau discloses a spinhole with an inlet zone and teaches that “the size and geometry of the hole are preferably selected to maximize the stability of the dope flow through the hole” (column 6, lines 3-5) and it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to modify the spinhole geometry as claimed for the purpose of maximizing the stability of the product. *See In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235.*

16. With respect to claim 10, Kavesh does not teach an Lo/Do ratio of at least 10.

In the same field of endeavor, spinning polymer fibers, Chau teaches spinholes containing spinholes with constant diameter inlet zones zones (column 5, lines 31-32, figure 1) for the purpose of effectively transitioning to the capillary section. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spinholes used in the method taught by Kavesh by adding a constant diameter inlet zone as taught by Chau for the purpose of effectively transitioning to the capillary section.

The combination as applied above discloses the claimed invention except for the inlet zone having Lo/Do of at least 10. It would have been obvious to one having ordinary skill in the art at the time of the invention to choose such a ratio since Chau discloses a spinhole with an inlet zone and teaches that "the size and geometry of the hole are preferably selected to maximize the stability of the dope flow through the hole" (column 6, lines 3-5) and it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to modify the spinhole geometry as claimed for the purpose of maximizing the stability of the product. *See In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235.*

17. With respect to claim 11, Kavesh teaches:

wherein a spinplate comprising at least 10 spinholes ("a 16-hole spinneret", column 6, line 7), …, a contraction zone with cone angle in the range of 10-60° ("the spinneret holes 28 should have a tapered entry region 30", column 4, lines 49-50, figure 2), and a downstream zone of constant diameter Dn with Ln/Dn at most 15 is applied ("followed by a capillary region of constant cross-section 32 in which the length/diameter (L/D) ration is more than about 10:1",

column 4, lines 50-52).

Kavesh does not teach:

each cylindrical spinhole having a inflow zone of constant diameter Do with Lo/Do at least 10

In the same field of endeavor, spinning polymer fibers, Chau teaches spinholes containing spinholes with constant diameter inlet zones zones (column 5, lines 31-32, figure 1) for the purpose of effectively transitioning to the capillary section. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spinholes used in the method taught by Kavesh by adding a constant diameter inlet zone as taught by Chau for the purpose of effectively transitioning to the capillary section.

The combination as applied above discloses the claimed invention except for the inlet zone having Lo/Do of at least 10. It would have been obvious to one having ordinary skill in the art at the time of the invention to choose such a ratio since Chau discloses a spinhole with an inlet zone and teaches that the size and geometry of the hole are preferably selected to maximize the stability of the dope flow through the hole" (column 6, lines 3-5) and it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to modify the spinhole geometry as claimed for the purpose of maximizing the stability of the product. *See In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235.*

18. With respect to claim 13, Kavesh teaches:

wherein a 3-15 mass% solution ("12 wt% linear polyethylene", column 5, line 55) of linear UHPE of IV 15-25 dl/g ("the linear poluethylene was himont UHMW 1900 having an intrinsic viscosity

of 18 dl/g", column 6, lines 1-2) is spun through a spinplate containing at least 10 spinholes ("a 16-hole spinneret", column 6, line 7) into an air-gap ("passed through a spin gap", column 6, lines 11-12), the spinholes comprising a contraction zone with a cone angle in the range 10-60° (the spinneret holes 28 should have a tapered entry region 30", column 4, lines 49-50, figure 2) and comprising a zone of constant diameter Dn ("followed by a capillary region of constant cross-section 32", column 4, lines 50-51) … downstream of a contraction zone, while applying a fluid draw ratio DRfluid = DRsp X DRag of at least 100 (obvious - see the rejection of claim 12) and a draw ratio DRsolid of between 10 and 30 (see "solid state stretch" Table 1).

Kavesh does not teach that the constant diameter zone has an Ln/Dn smaller than 10.

In the same field of endeavor, spinning polymer fibers, Chau teaches that "the length of the capillary is preferably no more than about 10 times the diameter of the capillary" (column 5, lines 51-53) for the purpose of stabilizing the filaments based on the material being drawn and draw conditions, though Chau also teaches that "the length of the capillary section is not critical" (column 5, lines 45-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spinholes used in the method taught by Kavesh by keeping the Ln/Dn ratio below 10 for the purpose of stabilizing the filaments.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALISON HINDENLANG whose telephone number is (571) 270-7001. The examiner can normally be reached on Monday to Thursday 7:30 - 5 pm; Every other Friday 7:30 - 4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALH

/Philip C Tucker/

Supervisory Patent Examiner, Art Unit 1791